

REMARKS

By the present amendment, independent claim 31 has been amended to obviate the examiner's objections thereto and/or to further clarify the concepts of the present invention. In addition, claim 27 has been cancelled and the dependency of dependent claims 28 through 13 have been modified. Entry of these amendments is respectfully requested.

In the Office Action, claim 28 was rejected under the second paragraph of 35 U.S.C. § 112 as being indefinite, it being asserted that the phrase "Deep RIE" was unclear as to scope. Reconsideration of this rejection in view of the following comments and the attached documents is requested.

Contrary to the assertion contained in the Action, it is submitted that the phrase "Deep-RIE" has an established technical meaning. In particular, this phrase refers to a specific type of reactive ion etching used for forming a vertical hole (non-trapezoidal hole). In support thereof, the attention of the examiner is directed to the attached a copy of a relevant page from the web site of Stanford Nanofabrication Facility. In addition, attention is directed to an internet page located in a Google search for the subject Deep-RIE technique. The term "deep" in the phrase "Deep-RIE" does not refer to the depth of an etched hole, although this etching method (also referred to as "Bosch process") is normally used to form a relatively deep hole. Further, it should be recognized that the word "Deep"

is capitalized.

For the reasons set forth above, withdrawal of the rejection under the second paragraph of 35 U.S.C. § 112 is respectfully requested.

Claims 27-31 were rejected under 35 USC § 103(a) as being unpatentable over the patent to Lin et al in view of the patent to Sumi et al. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

With respect to this rejection, it is to be noted that the Lin patent has an effective filing date of September 25, 2002. Further, the effective filing date of the subject application is April 8, 2002, the present application being a division of Serial No. 10/117,219 filed April 8, 2002 (now issued as US Patent No. 6,734,763). Therefore, the Lin patent is not effective art to the subject application under the provisions of 35 USC § 102(e).

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 28 through 31 as amended over the cited patents are respectfully requested.

Serial Number: 10/764,520
OA Dated December 22, 2005
Amdt. Dated April 24, 2006

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Website Printout (2)

Deep RIE: Page 1 of 2

Deep RIE

Deep reactive ion etching is used to etch deep cavities in substrates with relatively high aspect ratio. Most systems utilize the so-called "Bosch process", in which a fluor polymer is used to passivate the etching of the sidewalls. Typical aspect ratios of 10-20 can be achieved.

Process

Advanced silicon dioxide etch (AOE) with photolithography

Silicon DRIE with photolithography (Unaxis VLR 700)

Silicon DRIE with photolithography (PlasmaTherm 770)

Deep RIE (Bosch process)

Deep RIE (Bosch process) with photolithography

Silicon DRIE

Silicon DRIE with anti-foaming SOI

Silicon DRIE

Advanced oxide etch

Silicon DRIE (Bosch Process)

Silicon DRIE (Bosch Process) Plasma Therm 770

Silicon DRIE - SOI/No Lag (Etch rate independent of feature size)

Silicon DRIE (Bosch Process)

Silicon DRIE

Silicon RIE (smooth sidewalls)

Silicon deep RIE

Silicon oxide dry etch

Deep RIE (Bosch process)

Silicon DRIE

Silicon DRIE II

Results Page: 1 2

Base Process Modular Process

Serial No. 10/764,520
Attachment to Resp. Filed 4/24/06



Stanford Nanofabrication Facility Equipment

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STS Deep RIE Etcher: stsetch



Description:

- Oxide or photoresist may be used for mask
- Etches up to 6µm/minute
- Metals may not be used as an etch mask, though they can be used as a mask stop
- Au, Cr, Ni, and magnetics are never allowed in the machine

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